

OTHER COURSES

(Dates subject to change)

No.

IN WASHINGTON, D.C.

- 365† Protective Relays and Switchgear Controls for Industrial and Commercial Power Systems (Jan 8-Mar 19)
 20 Operations Research (Jan 10-12)
 428 Antennas (Jan 10-14)
 400 Data Communications Via Fading Channels (Jan 10-14)
 247 Technology Trends in Communications (Jan 10-14)
 407 Automated Document Storage and Retrieval Systems (Jan 11-13)
 244A† Temperature Control Systems for Heating and Air Conditioning; Calibration and Troubleshooting (Jan 15-Feb 22)
 415† Practical Digital Design (Jan 15-Feb 26)
 283† Critical Path Method (Jan 15-Mar 5)
 349 Design and Prediction of Sonar Systems (Jan 17-21)
 363 Writing Professional/Technical Communications (Jan 18-21)
 429 Applications of CCD and SAW to Communications (Jan 18-21)
 411 Digital Signals (Feb 21-25)
 396 Statistical Techniques for Use in Biomedical Studies (Jan 24-26)
 436 Integrated Circuits and Applications (Jan 24-26)
 435 Telecommunications (Jan 24-28)
 347 Photo- and Electro-Optical Imaging Systems (Jan 25-27)
 427† Analog Circuit Design Techniques (Jan 29-Mar 26/no class Feb 19)
 431 Building Economics and Life Cycle Costing (Jan 31-Feb 3)
 241 Modern Data Communications (Jan 31-Feb 4)
 291 Project Management (Feb 2-4)
 369 Cable TV Techniques and Usage (Feb 7-11)
 302 Spread Spectrum (Feb 7-11)
 307 Digital Image Processing of Earth Observation Sensor Data (Feb 14-17)
 387 Microprocessors/Microcomputers (Feb 14-18)
 294 Effective Written Communications (Feb 15-Apr 19)
 434* Antitrust Law for Engineers and Administrators (Feb 17-Apr 21)
 269 Construction Estimating (Feb 23-25)
 218 Medical and Hospital Control Systems (Feb 18-Mar 2)
 251 Nonparametric Statistics (Feb 28-Mar 2)

IN MIAMI, FLORIDA

- 409M Airborne Microwave and Millimeter Radar (Jan 24-28)
 382M Switched Telephone Networks (Jan 24-28)
 355M Patent Law for Engineers and Scientists (Jan 31-Feb 2)
 345M Standards and Specifications (Feb 1-3)
 374M Structured Programming Software Engineering (Feb 7-11)
 322M Computer Security (Feb 8-10)
 391M Distributed Processing Concepts and Techniques (Feb 8-11)
 376M Analysis and Prevention of Material Failure (Feb 14-18)
 420M Life Cycle Costing (Feb 15-17)
 278M Intensive and Coronary Care Units (Feb 16-18)
 285M Distribution/Warehousing (Feb 28-Mar 2)
 314M Data Base Management (Feb 28-Mar 2)
 368M Modern Digital Communications (Feb 28-Mar 4)

IN TIDEWATER, VIRGINIA

- 310T Microprocessors (Jan 19-21)
 252T Electromagnetic Compatibility (Jan 24-28)
 224T Design-to-Cost (Feb 1-3)

IN SAN DIEGO, CALIFORNIA

- 203S Radar Systems (Jan 17-21)
 349S Design and Prediction of Sonar Systems (Feb 28-Mar 4)

*Night classes
 †Saturday classes

UNIVERSITY POLICY ON EQUAL OPPORTUNITY

In accordance with the stated policy of its Board of Trustees and in conformity with federal laws and regulations, George Washington University does not discriminate against any person on the bases of sex, race, color, religion, or national origin in any of its education or employment programs or activities. Federal regulations implementing Title IX of the Education Amendments of 1972 call for an explicit statement that the requirement not to discriminate on the basis of sex extends to employment in and admission to such programs and activities.

Inquiries concerning the application of this policy and federal laws and regulations concerning discrimination in education or employment programs and activities may be addressed to the Office of the University's Coordinator of Equal Opportunity Programs or to the Director of the Office of Civil Rights of the Department of Health, Education and Welfare.

DETACH ENTIRE PANEL AND MAIL TO:
 Continuing Engineering Education, The George Washington University, Washington, D.C. 20052
 Please Note: We occasionally mail to selected lists which cannot be cross-checked against our files. Therefore, you may receive a duplicate of this announcement. If so, we hope you will pass it along to an interested associate.

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SOFTWARE DESIGN FOR DATA COMMUNICATION SYSTEMS

June 1-3, 1977

Please Return Entire Panel

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SCHOOL OF ENGINEERING AND APPLIED SCIENCE

CONTINUING ENGINEERING EDUCATION PROGRAM

SOFTWARE DESIGN for DATA COMMUNICATION SYSTEMS

JUNE 1-3, 1977

ROUTE TO:



THE
GEORGE WASHINGTON
UNIVERSITY

WASHINGTON, D.C. 20052
 (202) 676-6106
 (800) 424-9773

SOFTWARE DESIGN FOR DATA COMMUNICATION SYSTEMS

DESCRIPTION

This course is designed for systems analysts, designers, planners, project managers, programmers, and others who are involved in the requirements analysis, design, implementation, or support stages of data communications systems.

The presentation will cover the major considerations of software design for remote batch, message switching, time sharing, transaction processing, packet switching, and distributed network data communications systems. The course will include both applications and operating systems concepts and will consist of classroom as well as workshop sessions.

The participant should acquire a detailed understanding of the concepts of resource management in a data communications system; the principal alternatives in network management today; and an understanding of the languages used, table structures required, and management and control responsibilities necessary to design a data communications software system.

There is no prerequisite for this course; however, the student should have some familiarity with computer languages and computer terminals.

TOPICAL OUTLINE

Overview of Data Communications Systems

- Front Ending
- Data Concentrators
- Intelligent Terminals
- Satellite Processing Systems
- Network Systems

Data Communications Software Architectures

- Message Queuing
- Modified Batch
- Transaction Processing
- Timesharing
- Network Control
- Error Recovery

Methods Used in Building Software Systems

- Monolithic Systems
- Modular Systems
- Table Driven Systems
- Demand Driven Scheduling

Analysis of Software Designs

- Project Objectives
- Parameters
- Throughput
- Response Time
- Error Levels
- Storage
- Back Up
- Complexity

Data Communications Programming Languages

- Problem Oriented
- Machine Oriented
- Microprogrammed

- Protocol Oriented
- Command Oriented

Functions of Data Communications Software

- Protocol Handling
- Code Conversion
- Formatting
- Transaction Scheduling
- Resource Allocation
- Queuing
- System Monitoring
- Network Management
- Hardware Interrupts
- Error Recovery
- Blocking/Deblocking
- Encoding
- Encrypting
- Device Management

Operating System Control Design Alternatives

- Nucleus
- Kernel Philosophy
- Activity Scheduling - Fixed Sequence
- Activity Scheduling - Dynamic
- Distributed Intelligence
- Master/Slave Disciplines

Data Management for Data Communications

- Message Queues
- Device Queues
- Function Queues
- Network Configuration Control
- Poll/Call Sequence Control
- Spooling/Disk Mapping
- Data Staging
- Dynamic Priority Allocation

Data Communications System Software Design Constraints

- Business to be Supported
- Data Formats
- Objectives
- Systems Growth Potential
- Maintenance

Hardware Components in Data Communications

- Terminals
- Intelligent Terminals
- Concentrators
- Front-end Processors
- Nodes of a Distributed Network
- Batch Processing Stations

System Performance Measurement

- Tracing
- Archiving
- Journaling
- Time Histories
- Priority Changing
- Network Stress Analysis

Network Control Architectures

- Hierarchies
- Rings
- Distributed Systems
- Voluntary Systems
- ARPA-like Systems
- Other Systems
- Case Studies
- Review and Discussion

INSTRUCTOR

William D. Skees, President of Skees Associates, Inc., an automation consulting firm, is a consultant to management in government and industry. His clients include the Industrial College of the Armed Forces, the Agency for International Development, and several large firms in real estate, manufacturing, and publishing. Mr. Skees has developed computer and communications systems for the U.S. Navy, the Government Printing Office, the University of Kentucky, and Control Data Corporation. He is a computer scientist concentrating in data communications, computer center management, automation planning, and information retrieval and publishing systems. He is a reviewer for the Association for Computing Machines. Mr. Skees is the course coordinator and principal lecturer.

FEE

The fee for the course is \$365. This includes lecture notes, and supplies. Make checks and purchase orders payable to GWU, Continuing Engineering Education. Free parking is provided. Participants may delay payment until arrival.

HOUSING AND MEALS

Housing and meals are not provided. However, there is a wide variety of hotels, motels, and restaurants nearby. Information on available accommodations will be sent if requested.

LOCATION AND HOURS

Orientation will be at 8:15 a.m. on the first day; classes will meet from 8:30 a.m. to 4:15 p.m. daily in Room 641 of the University Library, 2130 H St., N.W. (corner of 22nd and H), Washington, D.C.

CERTIFICATE

A Certificate of Completion will be issued to those attending the full course.

CONTINUING EDUCATION UNITS (CEU)

Continuing Education Units (1.8) will be awarded for the satisfactory completion of this course. The CEU is a unit of measurement for recording noncredit learning in qualified continuing education programs. It provides a standardized means for business, industry, and government to measure in-service education. A permanent transferable record is maintained.

APPLICATIONS

Tentative or final registration should be made by telephone as soon as practicable. Apply by letter, telephone, or purchase order to Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052, (202) 676-6106, or the toll free number (800) 424-9773.

SPECIAL COURSES

Arrangements can be made to design certain courses to meet the needs of an individual activity for presentation on or off campus.